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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/566,751

02/01/2006

Jungo Miyazaki

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08/21/2007

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EXAMINER

ZHU, JOHN X

ART UNIT

PAPER NUMBER

2858

MAIL DATE

DELIVERY MODE

08/21/2007

PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary

Application No.

10/566,751

Applicant(s)

MIYAZAKI ET AL.

Examiner

John Zhu

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 14 June 2007.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-13 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-13 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 01 February 2006 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|---|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date <u>9/7/06, 7/3/07</u> . | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Election/Restrictions

1. Applicant's election without traverse of claims 1-13 reading on Fig. 4 in the reply filed on 6/14/2007 is acknowledged.

Drawings

2. Figures 9-12 should be designated by a legend such as --Prior Art-- because only that which is old is illustrated. See MPEP § 608.02(g). Corrected drawings in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. The replacement sheet(s) should be labeled "Replacement Sheet" in the page header (as per 37 CFR 1.84(c)) so as not to obstruct any portion of the drawing figures. If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

3. The drawings are objected to under 37 CFR 1.83(a) because they fail to show Ts and Tf as described in the specification, page 20. Any structural detail that is essential for a proper understanding of the disclosed invention should be shown in the drawing. MPEP § 608.02(d). Corrected drawing sheets in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. The

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figure or figure number of an amended drawing should not be labeled as "amended." If a drawing figure is to be canceled, the appropriate figure must be removed from the replacement sheet, and where necessary, the remaining figures must be renumbered and appropriate changes made to the brief description of the several views of the drawings for consistency. Additional replacement sheets may be necessary to show the renumbering of the remaining figures. Each drawing sheet submitted after the filing date of an application must be labeled in the top margin as either "Replacement Sheet" or "New Sheet" pursuant to 37 CFR 1.121(d). If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

Specification

The following guidelines illustrate the preferred layout for the specification of a utility application. These guidelines are suggested for the applicant's use.

Arrangement of the Specification

As provided in 37 CFR 1.77(b), the specification of a utility application should include the following sections in order. Each of the lettered items should appear in upper case, without underlining or bold type, as a section heading. If no text follows the section heading, the phrase "Not Applicable" should follow the section heading:

- (a) TITLE OF THE INVENTION.
- (b) CROSS-REFERENCE TO RELATED APPLICATIONS.
- (c) STATEMENT REGARDING FEDERALLY SPONSORED RESEARCH OR DEVELOPMENT.
- (d) THE NAMES OF THE PARTIES TO A JOINT RESEARCH AGREEMENT.
- (e) INCORPORATION-BY-REFERENCE OF MATERIAL SUBMITTED ON A COMPACT DISC.
- (f) BACKGROUND OF THE INVENTION.
 - (1) Field of the Invention.

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(2) Description of Related Art including information disclosed under 37 CFR 1.97 and 1.98.

(g) BRIEF SUMMARY OF THE INVENTION.

(h) BRIEF DESCRIPTION OF THE SEVERAL VIEWS OF THE DRAWING(S).

(i) DETAILED DESCRIPTION OF THE INVENTION.

(j) CLAIM OR CLAIMS (commencing on a separate sheet).

(k) ABSTRACT OF THE DISCLOSURE (commencing on a separate sheet).

(l) SEQUENCE LISTING (See MPEP § 2424 and 37 CFR 1.821-1.825. A "Sequence Listing" is required on paper if the application discloses a nucleotide or amino acid sequence as defined in 37 CFR 1.821(a) and if the required "Sequence Listing" is not submitted as an electronic document on compact disc).

Claim Objections

4. Claim 3 is objected to because of the following informalities: misspelling of "operates" on line 2. Appropriate correction is required.

Claim Rejections - 35 USC § 112

5. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

6. Claim 9 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

The limitation "getting to said reception means" is unclear.

Claim Rejections - 35 USC § 102

7. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

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(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

8. Claims 1, 2, 9 and 12 are rejected under 35 U.S.C. 102(b) as being anticipated by Lytton (5,384,715).

With respect to claims 1 and 12, Lytton discloses all aspects of the claim including a system and method of evaluation comprising oscillation means (Fig. 2, element 204) for emitting an electromagnetic wave to strike the surface of a multilayer object (102-105), reception means (205) for receiving electromagnetic waves generated by the reflection, processing means (206) for counting the number of layers on basis of the reflected signals (Column 3, lines 44-46).

With respect to claim 2, Lytton further discloses the oscillation means oscillating an electromagnetic pulse (Column 1, lines 42-43), and the count is on the basis of the counted number of electromagnetic pulses received (Column 3, lines 44-46).

With respect to claim 9, Lytton further discloses propagation means (Isolator 203) for propagating the signal emitted from the oscillating means through a propagation route getting to the reception means.

Claim Rejections - 35 USC § 103

9. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and

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the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

10. Claims 11 and 13 are rejected under 35 U.S.C. 103(a) as being unpatentable over Lytton (5,384,715).

With respect to claims 11 and 13, Lytton does not explicitly disclose the oscillating means contains a component having a frequency in range from 30 GHz to 100 THz.

However, optimization of ranges by routine experimentation is not patently distinct when the general conditions of a claim are disclosed in the prior art. In re Aller, 220 F.2d 454, 456, 105 USPQ 233, 235 (CCPA 1955)".

Since the frequency of transmitted signal is based on what the device under test is (i.e. higher frequency for thinner materials, etc.), it would have been obvious to modify Lytton to include frequencies in the desired range for the purpose of penetrating and characterizing different desired materials.

11. Claim 3 is rejected under 35 U.S.C. 103(a) as being unpatentable over Lytton (5,384,715) in view of Bible et al. (5,384,543).

With respect to claim 3, Lytton does not explicitly disclose oscillating a continuous wave and count the number of layers based on the detected phase shift.

Bible disclose that the reflected rays (Fig. 2) at each interface define a vector that "varies in amplitude and phase angle depending upon the path length, the number of reflections of the ray and the distance of the penetration" (Column 4, lines 10-13). Bible further discloses applying a continuous signal (column 2, lines 49-54) and detecting

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phase differences of the reference and reflected signals to determine variations in the material. Although Bible does not explicitly disclose counting the number of layers, the phase delay supplies necessary information indicative of this data.

Accordingly, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify Lytton include a continuous signal and phase detection system as taught by Bible for the purpose non-destructive evaluation of structural characteristics such as size and location, etc. (column 1, lines 18-21)

12. Claims 4, 5 and 10 are rejected under 35 U.S.C. 103(a) as being unpatentable over Lytton as applied to claim 1 above, and further in view of Bible and Wochnowski et al. (5,086,279).

With respect to claim 4, Lytton discloses all aspects of the claim except for second reception means for receiving transmission through the layer, and second processing means for detecting a phase shift of the transmitted and reference waves to determine the number of layers.

Wochnowski discloses second reception means (28) that detects the signal of the wave transmitted through the layer (1) and second processing means (11) that detect the phase shift of the transmitted (128) and reference (29) waves.

Bible discloses the phase shift of a test wave and reference wave contains information regarding the number of layers of device under test ("interface reflections", see the rejection of claim 3 above).

All of the elements are known in Lytton, Bible and Wochnowski. Thus, it would have been obvious to one of ordinary skill in the art at the time the invention was made to incorporate the second reception means and processing means as taught by Wochnowski and the phase shift information as taught by Bible into the device of Lytton for the purpose of achieving a more reliable and accurate system that takes into account both reflected and transmitted waves.

With respect to claim 5, Lytton discloses emitting electromagnetic pulses (Column 1, lines 42-43) but does not explicitly disclose the second reception means has processing means for detecting a delay time between the transmitted wave and the wave detected when the multilayer object does not exist (also read as reference wave), and counting the number of layers based on the detected delay time.

However, this is the same principle Lytton uses in determining the number of layers and thickness of layers (reflected waves' peak values and delay time between transmitted wave and wave when multilayer object does not exist (reference wave), column 3, lines 44-51). Also, the relationship between the thickness and number of layers is well known for homogenous layers.

Hence, it would have been obvious to one of ordinary skill in the art at the time the invention was made modify Lytton use the detected delay time to achieve the predictable results of determining the thickness and number of layers of a multilayer object.

With respect to claim 10, although the references do not explicitly disclose a plurality of the means used for counting the number of layers at a plurality of positions, duplication of parts is not patentably distinct unless a new and unexpected result is produced. See *In re Harza*, 274 F.2d 669, 124 USPQ 378 (CCPA 1960).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to have a plurality of means for the purpose of backing elements in the case of mechanical failures.

13. Claims 6-8 are rejected under 35 U.S.C. 103(a) as being unpatentable over Wochnowski et al. (5,086,279) and Lytton.

With respect to claims 6 and 7, Wochnowski discloses oscillation means (6) for emitting wave to an object (1), reception means (11) for receiving the wave transmitted through the object, a processing means (13) for detecting a phase shift (equivalent to delay time) of the transmitted wave relative to the wave that is detected when the multilayer object does not exist (reference wave) (Column 5, lines 23-27).

Wochnowski does not explicitly disclose determining the number of layers based on the phase shift or emitting a pulse.

Lytton discloses emitting an electromagnetic pulse (Column 1, lines 42-43) and determining the thickness of layers based on measured delay time (column 3, lines 44-51). Also, the relationship between the thickness and number of layers is well known for homogenous layers. One of ordinary skill in the art would recognize this would also

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apply to transmitted waves in addition to reflected waves as the principle behind measuring delay time is the time a wave is delayed in any medium.

Accordingly, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify Wochnowski to calculate the thickness of the layers via phase shift/delay time based on pulse emitted as taught by Lytton, and apply well known relationship between thickness and number of layers to determine the total number of layers.

With respect to claim 8, Wochnowski further discloses dividing means (in source 6) to divide the wave into a first wave (from 7) for striking the object and another wave (via line 12) to reception means.

Conclusion

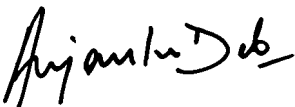
Any inquiry concerning this communication or earlier communications from the examiner should be directed to John Zhu whose telephone number is (571) 272-5920. The examiner can normally be reached on M-F, 8-4:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Andrew Hirshfeld can be reached on (571) 272-2168. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

JZ


ANJAN DEB
PRIMARY EXAMINER

John Zhu
Examiner
Art Unit 2858

